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ON HARELIP.



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THERE are few subjects in surgery that have attracted more attention than the congenital malformation known as harelip, and it is not to be wondered at that the deformity should have excited so much interest, inasmuch as it is an obvious physical defect which greatly distresses the patient's parents as well as the patient himself, who throughout life is more or less painfully conscious of his condition.

The principal objects of the present communication are, first, to give the results of inquiries made into the history and literature of the subject of harelip, briefly referring to such topics as are not usually included in works on systematic surgery; second, to illustrate by cases that have been under observation, chiefly at the hospital, some practical points in the treatment of the malformation; and lastly, to group together the most important operations that have been devised and practised for the relief of the deformity.

Harelip is a congenital malformation, arising from an arrest of development of the fœtal structures. Some writers speak of it as being produced by accidental wounds, as from burns, ulcerations, &c., in which the edges have not united,¹ but the term harelip should be restricted to the congenital variety. It would, for example, be obviously improper to speak of such a

¹ Samuel Cooper's First Lines, p. 501.

case as this (fig. 1, taken from a photograph) as one of harelip. The patient was a girl, aged 14, recently under my care at

FIG. 1.



the hospital, the greater portion of whose lip had been bitten off by a woman. The wound healed slowly, and ultimately there was very little deformity. Pigné draws a suggestive distinction between the two conditions, in saying that an accidental harelip may affect indefinitely all kinds of shape and position, but the congenital form is always more or less perpendicular to the free edge of the lip, and has a red margin.¹

The various forms of harelip are too well known to require a lengthened description. The fissure may be on one side only, and therefore called unilateral or single harelip, or on both sides—bilateral or double harelip, and in rare cases it may extend towards the cheek, constituting commissural harelip. The extent of the fissure into the cheek differs, but if it involve Steno's duct then the persistent discharge of saliva causes great discomfort to the patient.²

FIG. 2.



FIG. 3.



The cleft in the upper lip may be a mere notch, single (fig. 2) or double (fig. 3), or it may extend into one nostril (fig. 4), or

¹ Costello's 'Cyclopædia of Practical Surgery,' art. "Lips."

² Follin et Duplay, 'Traité élémentaire de Pathologie externe,' t. 4, p. 639.

into the nostril on both sides (fig. 5). In some instances of double harelip the fissure reaches the nostril on one side only,

FIG. 4.



FIG. 5.



leaving a simple notch on the other (fig. 6); and in cases in

FIG. 6.



which the intermaxillary bones project, the soft tissue may either be united to the bone, thus (fig. 7), or be perfectly free,

FIG. 7.



FIG. 8.



thus (fig. 8). Any of these varieties may be complicated with a cleft in the hard or soft palate or in both.

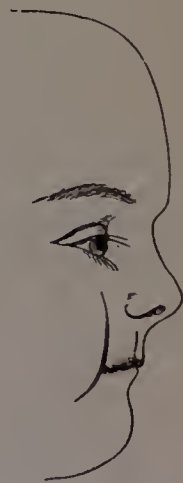
The upper lip is, as a rule, the seat of the deformity, and if a careful examination of the part be made, it will be found that in many cases there is in reality very little want of tissue, the lip being simply cleft on one or both sides. Sir W. Lawrence spoke of harelip as being "a mere separation"¹ of the parts, and M. Louis long ago drew attention to this point, remarking that in the deformity, whether the fissure be in one or both sides, "it is not accompanied by any loss of substance."² Although this theory does not invariably obtain, I have nevertheless seen several examples to make me believe that there is much truth in such statements; for instance, I was particularly struck with the appearance of the part in a case of double harelip, which was sent me in the summer of 1875 by my friend Mr. John Teale, of Scarborough. The accompanying engravings (figs. 9, 10) show very well how closely in contact the fissures were,

FIG. 9.



Full face, to show close approximation of fissure.

FIG. 10.



Side view of ditto.

and taking a side view it will be observed that the deformity is scarcely perceptible.

All surgeons are, I believe, agreed that the left side of the upper lip is by far the commonest situation for the deformity, and I am enabled to corroborate this from personal experience; thus, of 48 cases that have come under my observation, 24 were

¹ 'Lancet,' 1829. Vol. ii, p. 813.

² Louis, "Mém. sur le Bec-de-lièvre" ('Mém. de l'Acad. Roy. de Chir.,' tt. 4 and 5).

on the left side, 16 on the right, and 8 were double or involved both sides.

The other varieties of the deformity are rather surgical curiosities; thus, instances are on record in which the cleft was situated absolutely in the median line, which, as is well known, is the normal condition in the hare, and from which the malformation no doubt derives its title. Mr. Hazard, of Litcham, Norfolk, refers to such a case,¹ and M. Sanson cites an instance from Moscata, which he considers authentic, of "median harelip."² MM. Follin et Duplay, too, allude to such cases. "Nicati³ has seen a child two years of age in whose upper lip there was a congenital fissure exactly in the middle line, and Blandin has observed the same condition in the embryo."⁴ MM. Bouisson et Nélaton saw two analogous cases in the museums of Strasburg and of Tübingen, and others are reported by Ammon, Leuckart, and by Bitot, of Bordeaux.⁵ This condition must, however, be rare, inasmuch as Sir William Fergusson, whose experience on the subject of harelip is as great, if not greater, than any other living surgeon, states that he has never seen an instance of the defect in the mesial line.⁶ Chaussier, Dupuytren, and Cruveilhier, too, regard such cases as impossible.

In some instances the upper lip is altogether absent, as in a specimen at the Royal College of Surgeons, in which that part and the palate are entirely wanting.⁷

More rare still is a fissure involving the lower lip. About fifteen years ago I had the privilege of assisting Sir William Fergusson to operate in a case of this kind, which is the only instance that has come under my observation. The case is admirably depicted in his work on 'Surgery' (5th ed., p. 506). There are not many examples of this kind recorded, but Ranvier alludes to them.⁸ One result of such a deformity is that the saliva dribbles away, which is not only an an-

¹ 'Med. Times,' July 2, 1864.

² 'Lancet,' 1834, vol. ii, p. 665.

³ 'De Leporini Labii nature et origine,' Amsterdam, 1822.

⁴ 'Dict. de Méd. et de Chir. Pratiques,' art. "Bec-de-lièvre."

⁵ 'Journ. de Méd. de Bordeaux,' 1851-52.

⁶ 'Lectures on the Progress of Anatomy and Surgery,' 1867, p. 56.

⁷ 'Ter. Series,' No. 158.

⁸ 'Comptes Rendus de la Société de Biologie,' 3rd sér., t. iii, p. 93.

noyance, but is detrimental to the patient's health. Mr. S. Cooper refers to a patient under the care of M. Tronchin, who had a fissure in the lower lip, and who suffered from dyspeptic symptoms, all of which were removed after an operation had been performed.¹

An instance is recorded, by Parise (de Lille), of fissure of the lower lip combined with fissure of the lower jaw, with fissure of the tongue.²

Vrolik, in his beautiful work,³ gives several illustrations of commissural harelip and other deformities about the face; and M. Guersant figures a remarkable example, in which the fissure on each side extended to the eyelids⁴ (fig. 11).

FIG. 11.



There is another complication of harelip that I have occasionally met with, and to which I can find no reference in the text-books on surgery. It is a cyanotic condition of the child. This was well marked in a case that was sent me by my friend Mr. Haynes, of Waterloo Road. The late Mr. Edwards, of Edinburgh, alluded to this point; and Mr. George Lawson has published an interesting case, in which the cure of the cyanosis

¹ Costello, loc. cit., p. 811.

² 'Bull. de Thérap.' 1862.

³ 'Tabulæ ad illustrandum embryogenesis hominis,' 1849.

⁴ 'Dict. de Médecine et de Chirurgie Pratiques,' t. 4, art. "Bec-de-lièvre."

was effected by the operation for closing the fissure in the lip. During the operation for the harelip the child fainted; and Mr. Lawson believed that the recovery from the cyanosis was due to the lull in the circulation produced by the faintness, and which allowed the foramen ovale to close, and thus establish the double current.¹

Again, other deformities sometimes coexist with harelip; thus, once I saw a child who besides a harelip had an extra thumb on each hand, and another who had a bad internal squint, and a third who had a large nævus on the buttock.

Dr. Morell-Mackenzie has met with a case in which there was a congenital fissure between the arytenoid cartilages, with a trilobate epiglottis occurring in conjunction with harelip and cleft palate.²

Occasionally the surgeon meets with malformations which may be best termed incomplete. I was much struck with a case of this kind at the hospital some few months ago. The patient was a little girl about six years old, in whose nose there was a decided central dip extending the whole length of the nose, and a quarter of an inch in width, in which the skin was so thin that but for it the nose would have been cleft. Mr. Streatfeild reports a somewhat similar example occurring in the upper lip. The patient was a boy, aged 9, who had a notch in the prolabium, and also a cicatrix in the mucous surface. His mother stated most positively that he never had had harelip and that no operation had been performed.³

It would be foreign to the purport of the present paper to enter into the minute details of the development of the upper jaw and the intermaxillary bones. The reader is, therefore, referred for information on this subject to the works of Kolliker, Leuckart, Nesbitt, Vicq d'Azyr, and others, and especially to an excellent pamphlet by Dr. T. Hamy,⁴ and to a paper by Prof. C. O. Weber, "On the Intermaxillary Bone and its relations to Harelip and Cleft Palate."⁵

¹ 'Lancet,' June 7, 1862, p. 599.

² 'Med. Times,' April 19, 1862, p. 402.

³ 'Med. Times,' Nov. 13, 1858, p. 499.

⁴ 'L'os Intermaxillaire de l'homme a l'état normal et Pathologique,' 1868, Paris.

⁵ 'Med. Times,' Jan. 4, 1862, p. 18.

M. Coste¹ gives perhaps the clearest account of the changes that take place, and the following summary may be briefly referred to. He states that from the twenty-fifth to the twenty-eighth day of foetal life the mouth is formed. The frontal lobe becomes much enlarged, and shows a great hollow which divides into two smaller lobes, called by him the incisive centres, and from which the incisive bones and the middle portion of the upper lip are developed. The centres for the superior maxillæ, which form the lateral parts of the upper lip, converge one towards the other and come nearer to each side of the corresponding incisive centre. At the fortieth day the two incisive centres in the substance of which the incisive teeth are developed unite the one to the other in the middle line, and thus complete the superior lip in its middle. Thus, if the two lateral portions do not unite to the incisive portions, we have a double or bilateral harelip; if only one of these sides fail to unite, then we have a single or unilateral harelip.²

The ossification of the upper jaw taking place at so early a period in foetal life—about the seventh week—leaves anatomists still somewhat undecided as to the exact number of points of ossification in these bones; yet, arguing upon pathological facts alone, it appears certain that the intermaxillary bones exist, as first pointed out by Goëthe in 1786, as separate bones in man.³ A case of Mr. Bryant's further tends to prove the fact; the patient was a child, aged three years, who had necrosis of some portion of the upper jaw which followed a severe attack of measles. With a pair of dressing forceps the dead bones were readily removed, and they proved to be perfect specimens of the incisive or intermaxillary bones.⁴ Dr. Hamy refers to a similar case.⁵

Mr. Callender believes that the vomer and intermaxillary bones are developed in the membrane which covers the internasal cartilage, and at the anterior extremity of the vomer the process of ossification extends to form the intermaxillary bones.⁶ These

¹ 'Histoire générale en particulière du développement des corps organisés.'

² Follin et Duplay, loc. cit.

³ 'Dem menscher wie den thieren, ist ein Zwischenknocken der obern Kinnlade zuzuschreiben.'

⁴ 'Path. Soc. Trans.,' vol. x, p. 216.

⁵ Op. cit., p. 76.

⁶ 'Phil. Trans.,' 1869, p. 166.

bones are generally described as containing the four incisor teeth, two on each side. Mr. Thomas Smith, referring to these bones, says,¹ “the junction between the superior maxillary bones on either side and the intermaxillary bone in the centre takes place between the incisor and canine teeth, so that the intermaxillary bone carries in it the germs of the four incisor teeth; the cleft, therefore, if it exist in the bone, is always found on one or both sides between the incisor and canine teeth.” And referring to operative treatment, he adds, that “by removing the prominent part we deprive the patient of one or more of his teeth, therefore the part should be retained.”

In Mr. Erichsen's work² there is a woodcut showing the intermaxillary bones containing the four incisors, but from the specimens of single and double harelip that I have examined I feel sure that one or both of the lateral incisors are almost invariably absent, or, if present, are slightly if at all developed. Mr. Callender remarks on this point that the intermaxillary bones “assist in forming no inconsiderable portion of the sockets for the incisor teeth; but that they do not completely form them is a fact occasionally confirmed by the imperfect character of the sockets which lodge these teeth in those cases of cleft palate which have the intermaxillary bone isolated from the superior maxillæ.”³ M. St. Hilaire, writing on this subject, in 1833,⁴ says: “In the greater part of these cases the lateral fissure constantly corresponds with the point between the external incisor and canine teeth, or, in other words, to the line where the intermaxillary and maxillary bones should be united; but in some cases of more rare occurrence the fissure is found much nearer the median line between the *central and lateral incisors*.”⁵ Nicati, too, refers to similar examples. And, again, Dr. Hamy⁶ observes that the fissure traverses sometimes between the central and lateral incisor; and further on (p. 58) he speaks of the fissure being in some cases between the lateral incisor and canine on

¹ ‘Lancet,’ Dec. 21, 1867, p. 761.

² ‘Science and Art of Surgery,’ 5th ed., vol. ii, p. 348.

³ ‘Op. cit., p. 169.

⁴ ‘General and Particular History of Anomalies in the Organization of Man and Brutes.’

⁵ ‘Lancet,’ 1833, vol. ii, p. 531.

⁶ ‘Op. cit., p. 55.

one side, and between the central and lateral incisor on the other.

It remains to be proved if this latter condition is so very rare, for it is certain that in most cases that present themselves to the surgeon the central incisors are usually well marked, whilst the lateral incisors seem to have no existence. In order to strengthen this statement the reader is referred to the different works on surgery, and he will find, I venture to say, that in almost all the woodcuts illustrating the deformity of harelip, the two central incisors only, and not the lateral incisors, are depicted. For example, Dewar, in his cases, published in 1830, speaks of the "projection of the alveolar process, which was covered by its ordinary thin and red membrane, and crowned with *two teeth*."¹ And Syme, in 1842,² remarks that in most cases of harelip the projection comprehends an equal portion of both superior maxillary bones, the portion, namely, which in the lower animals is occupied by two distinct bones, the ossa incisiva or intermaxillary bones; but in the woodcut that accompanies his remarks the central incisors alone are shown. Again, Dr. Stolworthy narrates a case³ in which he removed the central portion, and in which the *two front* teeth, perfectly formed, were found; and M. Blandin reports a case of double harelip with projecting intermaxillary portion in a boy about ten years old, in which the *two middle* incisors were found.⁴ Again, Sir William Fergusson, in his works on surgery, gives several woodcuts illustrating the presence of the central, and not the lateral, incisors, and all the specimens presented by him to the Royal College of Surgeons show the two central incisors only in various stages of development.

I have carefully dissected several examples of the intermaxillary bones removed in double harelip, and have been led to the conclusion that the lateral incisors are almost invariably absent. The accompanying illustrations demonstrate these points. The specimen (represented in fig. 12, in which the anterior part of the bones has been cut away to show the teeth) was taken from a child aged five months. The other

¹ Cases of Harelip. 'Edin. Med. and Surg. Journ.,' 1830, vol. xxxiv, p. 88.

² 'Principles of Surgery,' 3rd ed., 1842, p. 475.

³ 'Lancet,' vol. ii, 1842-43, p. 326.

⁴ 'Gaz. des Hôpitaux,' 'Lancet,' 1843-44. Vol. i, p. 71.

specimen (fig. 13) was removed from a child aged fifteen months. In these cases there was not a trace of the lateral

FIG. 12.



FIG. 13.



incisors. Now, as it is generally known that the central incisors of the upper jaw are cut about the seventh month after birth, and that the lateral incisors follow pretty closely, appearing at from the seventh to the tenth month, the inference to be drawn is, that the lateral incisors are either wanting or are so ill-developed as not to be recognised. In other words, the cleft on each side seems to take their place. The same rule applies to single harelip, involving the jaw, as in the case of a child, aged two and a half years, whom Dr. Maybury, of Richmond, kindly sent me in April, 1875, and in which the lateral incisor was deficient. I may here say, after inquiring at the several museums connected with the metropolitan schools of medicine, that, with the exception of the specimens at the College of Surgeons and those at St. Thomas's Hospital, just referred to, the only other examples of intermaxillary bones removed in cases of harelip are to be found in the museum of Guy's Hospital, and these latter well illustrate the apparent absence of the lateral incisors.

Mr. Salter directed attention to this point in a case of harelip with double cleft palate, which he brought before the Pathological Society on March 6, 1855. The specimen was from a child eighteen months old, and contained the germs of the central incisors, and not the lateral as previously imagined. He adds, "From the general aspect of this specimen I was inclined to consider it as the incisor or intermaxillary bone separated by a *lusus naturæ* from the mouth proper; a section of it, however, throws some doubt on that opinion, as the rudiments of the lateral incisors are not contained in it, and such an idea is only tenable by imagining the laterals altogether suppressed." He made a vertical section, and in the cut surface were the imperfectly developed and rudimentary germs

of the superior central incisors of the temporary and permanent set, the former advanced in development, the latter in a very early condition.¹

I may add that my friend Mr. George Parkinson has kindly permitted me to examine his collection of over fifty models of the jaws in cases of harelip and cleft palate, and these abundantly prove that in most instances of harelip involving the jaw there is an absence of one or both lateral incisors. It should, however, be borne in mind that, apart from any congenital deformity of the lip, the lateral incisor is one of the teeth frequently wanting; thus, Mr. Tomes knows several families the members in each of which are destitute of lateral incisors in the upper jaw.²

There has been much speculation as to the causes of harelip. As a rule it is attributed to some shock or impression made on the mother during pregnancy. Sir William Fergusson, with many others, puts no faith in such views, and adds that he has often detected a partial defect in the upper lip and jaw of one or both of the parents, and since he directed my attention to this point, I have observed it in many instances.

I am myself somewhat slow to believe in the theory of maternal impressions, but I may allude to a case in which the coincidence was so marked as to leave little doubt that such impressions may have some influence in producing the deformity. In November, 1874, a child with single harelip was brought to me at St. Thomas's Hospital. The mother stated that whilst she was riding in an omnibus she was shocked at the appearance of a boy who had had harelip, and who had been operated on in early life. She had only been married a month, and spoke to her husband, mother, and sister of her fear that if she had a baby it might have harelip. When the child was born her first inquiry was, "Is he all right, or has he got a harelip?"

Again, in one of Dewar's cases, already referred to, the mother of the child resided previous to her marriage near a boy on whom he had operated for harelip, and she was perfectly familiar with the child's appearance. Soon after she became pregnant with her second child she was strangely impressed with the idea that

¹ 'Path. Soc. Trans.,' vol. vi, 1855, pp. 177, 178.

² 'Dental Surgery,' 2nd ed., 1873, p. 207.

her infant was to be born deformed, and she had repeatedly assured him that the case of the boy was rarely absent from her imagination. Indeed, which is of more importance, she mentioned to some of her friends previous to her confinement the unaccountable presentiment she entertained of the child's deformity.¹ Sir James Paget, too, refers to another striking example. These cases may, of course, be only coincidental, but they are interesting to notice.

Harelip seems in many instances to be hereditary, for it is not very uncommon for a surgeon to operate on two or three members of a family. Liston operated on four;² and in the case which Mr. John Teale sent me (already alluded to) of double harelip not involving the palate, the mother had been very successfully operated on as a child for a single harelip on the left side, and I have at the present time (February, 1876), under my care at St. Thomas's Hospital two children, sisters, aged fifteen months and one week respectively with the deformity.

There are remarkable examples recorded to show that harelip appears to run in families. Thus, M. Demarquay related a case at the Surgical Society of Paris, in which from the grandparents downwards eleven children had been born with harelip;³ and the same surgeon refers ⁴ to a singular malformation of the lower lip which was hereditary. The case was that of an infant affected with double harelip, and there existed on each side of the middle line of the lower lip a narrow channel containing clear mucus; a probe could be readily introduced and passed obliquely under the mucous membrane nearly as far as the frænum. The mother had the same deformity; she had had seven children, amongst whom four were born with harelip, and with precisely the same deformity of the lower lip as above described.

A correspondent in the 'British Medical Journal'⁵ also states that in his family harelip had been handed down from one branch of the family to another for the last hundred years. He

¹ Loc. cit.

² 'Med. Times and Gazette,' 1865, vol. ii, p. 333.

³ 'Lancet,' May 16, 1868, p. 642.

⁴ 'Dictionnaire de Méd. et Chir.,' tome 4.

⁵ 'Brit. Med. Journ.,' April 18, 1863, p. 412.

says, "I have a brother who has harelip, with complete division of the palate and alveolar process; and he has had three children out of seven affected with the same deformity, in every case as badly as himself. Another brother of mine," he adds, "who is now dead, had a daughter also affected with the malformation. I had also a cousin who was similarly affected, and he had a daughter affected." Again, Dr. Bellingham, of Dublin, operated on two brothers whose relations on both sides had been similarly affected, and these were all males; thus their father's grandfather had harelip, and a second cousin of their father's was similarly affected. On the mother's side two of her second cousins (both boys) had harelip.¹

With regard to the period of life at which the operation for harelip should be performed, the circumstances of each case are so widely different, that it is impossible to lay down any definite law. Generally speaking, it should be undertaken about the second or third month after birth, and this was the view taken by Lawrence,² Dupuytren,³ Houston,⁴ Rocca, and Mestenhauser.⁵ Sir W. Fergusson prefers about the end of the first month,⁶ and assuredly before teething. Others recommend leaving the operation until childhood; thus, Mr. South⁷ remarks, "I would never perform it before two years old; but if the parents can be persuaded to wait till the child is six or eight it is preferable;" and Dieffenbach advised that the operation should be postponed until dentition was accomplished.⁸

On the other hand, Paul Dubois, Malgaigne, Bandon,⁹ and Giraldés,¹⁰ and Abernethy,¹¹ all approve of a very early operation, that is, immediately or soon after birth. Guer-sant¹² gives as a special reason for dealing with the de-

¹ 'Dub. Med. Press,' vol. 33, 1855, p. 161.

² 'Lancet,' 1829, vol. ii.

³ Ibid., 1833, vol. ii, p. 293.

⁴ 'Med. Press,' 1842, vol. vii, p. 274.

⁵ 'Lancet,' 1846, vol. ii, p. 159.

⁶ 'Lectures on the Progress of Anatomy and Surgery,' 1867, p. 64.

⁷ Chelius by South, vol. i, p. 596.

⁸ 'Lancet,' 1846, vol. ii, p. 159.

⁹ Ibid.

¹⁰ 'L'Union Médicale,' 1865, p. 138.

¹¹ 'Lancet,' 1850, vol. i, p. 694.

¹² Ibid., 1826, vol. xii.

formity at this early period, *that children can do without the breast for four days*, an opinion shared by Mr. Douglas, of Stratford, who operated on a child two hours after birth.¹ M. Guersant further adds that, of seven children operated on immediately after birth, he failed only once, whilst out of seven children one month old he failed five times. Dr. Dawson, of Dungannon, operated on a child seven hours after birth.²

In some bad cases of double harelip the operation ought, in my opinion, to be done within the first three months, or even earlier, in order to save the life of the child. I have recently had under observation instances which have led me to this conclusion. I believe that in a great many examples we place patients in a worse condition to bear the operation by delay. They get thin and half starved and are then unfit to undergo any surgical procedure. Mr. Holmes, speaking of the indications that demand an early operation, says : “ If the child is suffering from want of nourishment in consequence of the food running out of the cleft in the nose and mouth, no time should be lost in operating, whatever the age of the child may be.”³ Mr. Henry Smith gives cogent reasons for an early operation.⁴ He thinks the child can suck better, and that in consequence of the lips being united the bones in the cleft palate (if it exist) become approximated. He refers, in illustration, to Mr. Bateman’s patient, who was operated on four hours after birth. In answer to Mr. Smith’s inquiry as to the condition of the patient, Mr. Bateman replied that the child had died at the age of three years of whooping-cough, and that at the time of death the fissure, which at birth was so large that the mother could put her finger into it, had contracted so much that it could scarcely admit the edge of a sheet of writing-paper.

Sir Astley Cooper,⁵ Syme,⁶ Colles,⁷ and others, believing that convulsions are common after the operation, deprecated the practice of operating immediately after birth. The idea that the operation induces convulsions appears to be more

¹ Ibid., 1854, vol. ii, p. 456.

² ‘Dub. Med. Press,’ 1845, p. 359.

³ ‘Surg. Treatment of Children’s Diseases,’ p. 115.

⁴ ‘Med. Times,’ 1854, p. 286.

⁵ ‘Lancet,’ 1823.

⁶ ‘Principles of Surgery,’ 1842, 3rd edit.

⁷ ‘Dub. Med. Press,’ March 20, 1844, p. 177.

imaginary than real; and Sir William Fergusson, with his very large experience, states that he has never met with a single instance.

It is not often that an adult applies to have the operation performed, excepting as a secondary measure, and with the view of improving the lip, but such cases are occasionally met with. Three years ago I operated on a man aged 25, and Mr. Haynes Walton records a case of operation in a patient aged 40.¹ In some rare exceptions the person goes through life without seeking surgical relief; thus, I was told at the hospital in December, 1875, by the mother of a child with harelip, that a cousin aged nearly 50, residing in the country, had harelip on which no operation had been performed.

In bringing the edges together the twisted or harelip suture of silk is usually employed, and if used it is better to take the thread round the needle in the form of a figure of 8, and not as is sometimes described and practised, in a circular fashion, round and round the needle. This form of suture is especially advantageous in cases of double harelip when support is required. Its chief disadvantage is that it is apt to cause ulceration. In suitable cases the single interrupted suture is preferable, and is commended on the high authority of Sir Astley Cooper,² Erichsen, Giralvés, and Guersant, and I have myself had several cases recently in which I have employed it with very satisfactory results. Some surgeons dispense with pins and sutures, and rely *entirely* on plaster so placed as to keep the edges in contact.³ The simple suture is preferable to the twisted, in bringing the edge of the lips together when divided for removing tumours of the upper jaw, &c.; but the twisted suture is better adapted for bringing the parts together after the removal of epitheliomatous growths, &c., from the lips, and also in cheiloplastic operations after burns.

Various substances besides silk have been used, such as catgut, horsehair, fishing twine, india rubber, &c. Some surgeons, especially MM. Giralvés, Depaul, Verneuil,⁴ Ansieux,⁵

¹ 'Lancet,' August 22, 1857, p. 198.

² 'Lancet,' 1823, p. 97.

³ 'Lancet,' vol. i, 1855, p. 485.

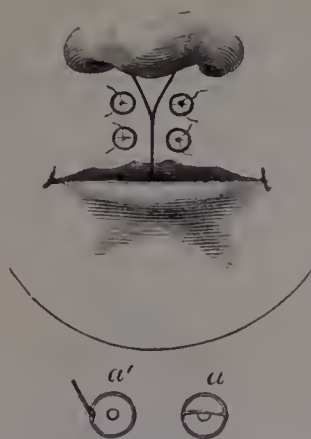
⁴ 'Med. Times,' August 27, 1864, p. 226.

⁵ 'Brit. and For. Med. Chir. Rev.,' vol. xxx, 1862, p. 543.

and others, prefer metallic sutures either of iron, silver, or silver-gilt. Others employ modifications of the shot suture of Bozeman and Sims. Mr. Brooke advocated bead sutures,¹ Mr. Pollock suggested a "gun-nipple" button, and Mr. Wood, of Gloucester, a suture which consists of one silver disc with a hole in it and a cross bar fixed at each end, and another disc, leaving the cross bar movable² (fig. 14, *a' a*). I have myself occasionally employed ordinary shirt buttons, which support the lip admirably. Van Onzenert used a piece of leather, with the same view,³ and Dr. Hammer employed a quilled suture, keeping the parts together with silk ribbon.⁴ M. Mayor used a ball of cotton for the same purpose.

Passing by the old practice of treating harelip by blisters and actual cautery, &c., I have now to refer to the various operations that have been suggested and practised to remedy the deformity of harelip; and in the first place I shall allude to

FIG. 14.



that which I believe to be the simplest and most rapidly performed, and attended as it is with the most satisfactory results to be the best. It is the one I myself almost invariably employ, carrying out the details as directed by my respected friend and teacher, Sir W. Fergusson. Let it be supposed

¹ 'Lancet,' May 21, 1859, p. 509.

² 'Med. Times,' Jan. 3, 1857, p. 4.

³ 'Costello's Surgery,' art. "Lips," p. 599.

⁴ 'Med. Press,' Aug. 2, 1865, p. 106.

that the patient is a child, say two months of age, with a single harelip on the left side. The surgeon, being seated, first covers his knees with a towel or mackintosh. He then places the child, who is enveloped in a cloth or mackintosh, in the recumbent posture, the head being directed towards him, and resting on his lap, the feet being in charge of a nurse, who sits facing him. Chloroform or ether may or may not be administered. The surgeon then proceeds to free the fissure on each side, thoroughly dividing any fræna or adhesions between the soft parts and the jaw which seem likely to interfere with the easy adaptation of the parts. He then directs an assistant who kneels on his right to grasp the right side of the cleft between the forefinger and thumb of his right hand. The surgeon now grasps the other side of the cleft with his left forefinger and thumb, and introducing a sharp-pointed narrow knife at the nasal extremity of the cleft, commencing on the left side or that over which he himself has control, carries the knife from above downwards towards the prolabium, removing as much of the edge as he thinks necessary (fig. 15). The same steps are repeated on the opposite side. The assistant, still retaining his

FIG. 15.



hold on the lip, now seizes with his left hand the loose flaps of skin with forceps, and the surgeon removes them at their nasal extremities with one or two touches of the knife. Some surgeons prefer scissors for paring the edges. Up to this point, if care be taken, there should be scarcely a drop of blood lost. The surgeon now desires the assistant to relax his hold of the right side, and passes one or more harelip pins from side to side, rather more than a quarter of an inch from the raw margin, the first needle being introduced just above the red portion of the lip or prolabium. A piece of unwaxed silk,

rather coarse, and nearly a yard in length, is then to be applied in the figure of 8 fashion, commencing at the nasal extremity, and the edges of the wound brought accurately together. Some surgeons prefer a separate thread for each pin, and put one point of interrupted suture through the mucous membrane of the lower part of the fissure just inside the mouth.¹ Others put interrupted sutures between the pins. Whatever plan be adopted, the threads are to be tied and their ends removed, after which the projecting portions of the needles are to be clipped, and if necessary a small piece of lint or plaster may be placed under their ends in order to protect the subjacent skin. Collodion may or may not be employed to cover the needles and thread. Several years ago I adopted a very simple and most efficacious plan of restraining the movements of the lip, by coating each cheek with a thickness of collodion about the size of a five-shilling piece, or larger. Broca refers to a somewhat similar method in '*Gaz. des Hôpitaux*,' June 8, 1872.

In cases of double harelip the proceeding is much the same. If the intermaxillary bones so project as to prevent the edges of the wound from coming nicely in contact, they may be removed or dealt with in one of the ways that will be referred to presently. In most cases it is necessary to pare the central portion, so as to make a continuous raw surface of a V shape (fig. 16).

FIG. 16.



As a rule, both sides of the fissure may be closed at the same time. The lateral portions of the fissures are to be made raw in the same way and in the same order as already referred to in describing the operation for single harelip. The harelip pins, which in double harelip are almost essential, are introduced as before from below upwards, the surgeon taking care to include the central portion by transfixing it with one or more of the needles. Or the pos-

¹ '*Erichsen's Science and Art of Surgery*,' p. 350.

terior surface of the central portion may, in some cases, be brought upwards, and its lower end backwards, as recommended by Dieffenbach, so as to form a quasi septum to the nose.¹ The operation is concluded, as already described.

The pins may be removed by a rotatory motion with an ordinary pair of carpenter's pliers on or about the third or fourth day, or even earlier, leaving the thread to drop off. Subsequently a little zinc ointment may be applied, although not always necessary. In some cases it is desirable to support the edges of the wound with a strip of plaster, and, if used, it should be cut in this form with four tails (fig. 17). If the patient be care-

FIG. 17.



fully watched it seldom happens that failure occurs; and even in those cases which do not unite by first intention it is remarkable what very satisfactory results follow if even the least particle of the sides adhere by granulation. I have seen some of the worst looking cases of double harelip turn out well with care and attention; indeed, there is often less deformity after the operation for double harelip than there is after that for the single; at all events the deformity is more symmetrical. I have in some instances reintroduced the needle, but the plaster has generally answered the purpose best, if there be the least attempt at union.

If the case is such as to demand the removal of the intermaxillary bones, they may be taken away with scissors or forceps either a day or two before or at the time of the operation, and as there is sometimes free hæmorrhage attending this procedure, the actual cautery should be at hand. Mr. Wardrop referred to the removal of the bone in 1826;² and Franco recommended the entire excision of the bony mass, followed by an attempt to unite the two upper maxillary bones in the middle line.³ Mr. Houston in 1842 operated on the intermaxillary bones by "paring off the outer lamina and removing the teeth, because the deformity it presented

¹ 'Holmes's Surgical Treatment of Children's Diseases,' p. 107.

² 'Lancet,' vol. xii, 1826, p. 800.

³ 'Lancet,' 1843-44, vol. i, p. 71.

was such as could not be remedied by Desault's method of pushing it into place by a graduated pressure."¹ Guersant forced the projection backwards violently. Blandin took a V-shaped piece out of the vomer and at once pushed the bones backwards.

Sir W. Fergusson is a strong advocate for removing the inter-maxillary bones, and in suitable cases takes them away by a kind of subperiosteal operation, enucleating either the whole of the bones or simply gouging out the incisor teeth.²

On the other hand, Mr. Collis states that the bone should never under any circumstances be taken away. This, he adds, "is so well established an axiom in surgery that it need not be insisted on;"³ and Mr. Butcher in his work⁴ figures certain instruments for "cutting through the projecting pieces in complicated harelip without dividing the soft parts and the vascular supply behind, previous to bending them back;" Langenbeck pared the edges of the prominent tubercle, and also the side of the maxillæ, and then transfixed the parts with a harelip pin.⁵

In witnessing the operation for harelip a bystander might suppose that the proceeding is a very simple affair, but there are a few practical points to which attention may be directed. It is of importance thoroughly to free the lip from the jaw on each side, so that the edges of the wound may be brought into contact without any strain on the pins or sutures, and in doing this the surgeon should remember to apply his knife quite close to the maxillary bone, as suggested by Franco,⁶ for in so doing the risk of hæmorrhage is diminished. Moreover, a sufficient quantity of the edge of each cleft should be taken away. As a rule too little is removed; hence an unsightly vertical dip is left. Then the incision should be made somewhat concave, with the concavity directed towards the fissure, and a sufficient amount of the prolabium should be taken away which obviates the V-shaped dip so often noticed after the operation. This concave incision was practised by Dieffenbach and others, and Syme

¹ 'Dub. Med. Press,' 1842, p. 1842, p. 131.

² 'Brit. Med. Journal,' Dec. 25, 1875, and Jan. 1, 1876.

³ 'Dublin Quart. Journal,' 1868, p. 299.

⁴ 'Essays on Op. Surg.,' p. 715.

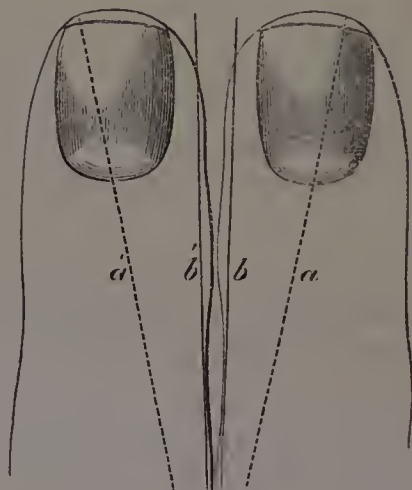
⁵ 'Archiv,' vol. ii, p. 230.

⁶ 'Costello's Surgery,' vol. ii, p. 813, 1861.

mentions it in the third edition of his 'Principles of Surgery.' The idea, however, seems to have been first suggested by M. Husson, jun., in 1847.¹

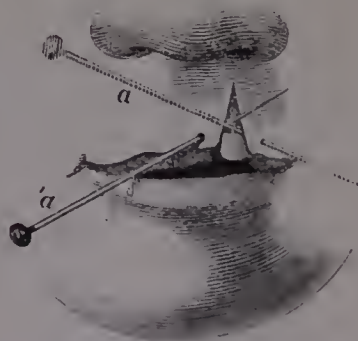
In describing the operation to pupils, I am in the habit of making them place the forefinger of each hand in apposition, thus—

FIG. 18.



and of assuming that the two fingers have to be united to make one perfect finger. It is clear that if this object is to be effected the incision must be carried in the direction of the dotted lines (*a' a*, fig. 18), so as to include the greater portion of each finger, for if a narrow strip only is taken (*b' b*, fig. 18), it is evident that

FIG. 19.



a groove will be left between the fingers and also a V-shaped gap at their extremities.

¹ 'Path. Ch.,' vol. ii, p. 703, 1847.

Then, in introducing the needles, the first should be placed nearest the prolabium, and it should be inserted on the right side from below upwards, and on the left side from above downwards (*a' a*, fig. 19). This manœuvre tilts down the prolabium, and thus brings the margin into a straight line. Dupuytren referred to this point in 1833, and he remarked that it was then not new.¹ Further, the needle should not go through the mucous membrane, but with that exception should transfix the whole of the lip. There are two reasons for carrying the needles to this particular depth: first, in order to give the greatest support to the sides; and, secondly, to secure to the superior coronary artery which lies close to the mucous membrane. M. Giraldés passed the stitch through the whole thickness of the lip.² The ligature should not be drawn too tightly, otherwise the compression may cause ulceration. The edges should simply be brought together neatly, and if the precaution of thoroughly dividing the adhesions to the jaw, as already described, be attended to, there will be very little tension on the parts. In cases where the tension is very great it may be useful to follow the practice of Ambrose Paré, and make a vertical incision on each side of the ala nasi, but such a proceeding is seldom necessary.

Finally, with regard to the duties of the assistant. He should be especially careful to compress the side entrusted to him firmly, and not relax his hold until he receives the signal from the surgeon. Moreover, in grasping the lip during the paring of the edge he should take care not to drag the part away, but rather to push it inwards towards the cleft so that the knife may make the necessary curve with the concavity towards the fissure as already stated.

There are yet two other points that have especial reference to the patient. It often happens after the operation that the upper lip will necessarily be so tightly drawn that the nostrils become temporarily closed, and the lower lip so contracted as to pout to such a degree as to overlap the upper, and thus interfere with respiration. In such cases it is only necessary to charge the nurse or mother to press gently from time to time the lower lip or chin downwards, so as to allow the air to enter

¹ 'Lancet,' 1833, vol. ii, p. 295.

² 'Bull. Gén. de Thér.,' 15 Août, 1863. 'Brit. Med. Journal,' Sept. 19, 1863.

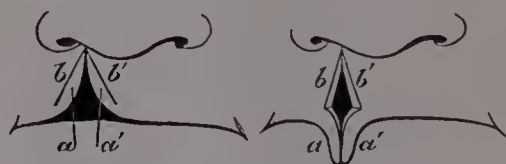
the mouth. This may appear a simple matter, but it is as important to the comfort as it is to the safety of the child. Again, the position of the child in sucking is one of some importance, for in severe cases of harelip, complicated with cleft palate, if the patient be placed in the recumbent posture the food is apt to pass through the nostrils instead of down the pharynx, hence there is risk of death from starvation. Under such circumstances it is only necessary to raise the child to the upright position, when deglutition can be readily accomplished.

It is obvious that no single operation is universally available for examples of harelip, and it is fortunate that the surgeon has a choice of numerous modes of procedure which have been successfully practised, and which may, no doubt, be again as successfully employed in suitable cases. To these I will now refer:—1st, as to the operation known as Malgaigne's. It appears that this operation was, as M. Roux states, previously performed by Clémot,¹ but Dr. Maurice Collis, of Dublin, writing in 1868, claimed it as the device of an English surgeon. Alluding to this (M. Malgaigne's operation) he says: "I learnt it twenty-one years ago from a fine old English surgeon, the late Samuel Smith, of Leeds. He told me that he had devised it some twenty or thirty years previously (that is, about 1820). Whether he ever published it I do not know. This improvement consists in reserving the lower portion of the parings at each side and turning them downwards so as to form a prominence along the margin."²

Malgaigne's operation is thus described:—He commences the incision at the superior part of the lip, and performs it from

FIG. 20.

FIG. 21.



Malgaigne's operation.

above downwards, employing scissors in the same manner as in

¹ Nélaton, 'Path. Chir.,' vol. ii, p. 703. 'Costello's Surg.,' vol. ii, p. 821.

² 'Dublin Quarterly Journal,' May, 1868, p. 294.

the ordinary operations, only when he arrives as low as possible (fig. 20, *a a'*), without detaching the cut piece, he stops. The same plan is followed on the other side of the labial fissure. There are then two small flaps which are adherent to the lip by a pedicle. After having reunited, by the aid of pins, the two margins of the cleft, in their whole extent, except towards their free border (that is, towards the bottom), these flaps are brought from above downwards, and approximated face to face (fig. 21, *b, b'*). The operator then judging of the length which it will be proper to leave them, in order to prevent the furrow, which is always so much dreaded in this point, shortens and finishes them as he thinks fit, preserving a piece varying in size according to the extent of vacuum which he has to fill (Fig. 21, *a a'*). Union is afterwards effected by approximating them with one or two interrupted sutures, or with a fine insect pin. If care is taken to place these uniting agents very near the free margin of the lip, the cicatrices will be scarcely visible.¹

A slight modification of the above operation has been suggested by M. Henry, of Nantes. The chief point of distinction is that the flaps are cut in a slanting direction, from skin to mucous membrane, as will be best indicated by the accompanying diagram (fig. 22).

FIG. 22.



Henry's operation.

M. Mirault, of Angers, employed one flap only:—thus, a flap is taken from above downwards, but left attached to the prolabium (fig. 23, *a*). On the other side of the cleft the margin is completely removed (fig. 23, *b*). The flap *a* is now turned down, and from being perpendicular is now horizontal, and forms the margin of the lip² (fig. 24, *a, b*).

¹ 'Gazette Médicale de Paris.' 'Prov. Med. Journal,' vol. viii, 1844, p. 260.

² 'Dictionnaire de Médecine et de Chirurgie Pratiques,' p. 701.

Mr. John Dix refers to a slight modification of this. He remarks that in cutting the flap *a* it should so slope as to take

FIG. 23.

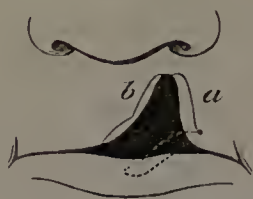
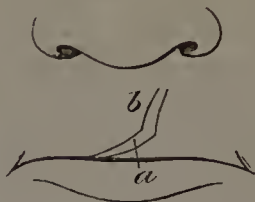


FIG. 24.



Mirault's operation.

away more of the skin than of the mucous membrane, and in treating the flap *b* the converse plan should be employed of cutting away a large piece of mucous membrane. In this manner he believes the flaps may more readily overlap.¹

M. Nélaton² devised and practised a simple, and in some cases a useful, procedure, but which is only practicable in cases in which the cleft does not extend into the nostril. It is, perhaps, most serviceable as a secondary operation in instances in which a V-shaped notch has been left. A semicircular incision is made above the fissure, thus (fig. 25):

FIG. 25.



Nélaton's operation.

The fissure is then pulled down, leaving a diamond-shaped wound. One or two needles are then placed across, and the raw surfaces adjusted.

M. Giraldés devised a plan known as the mortise operation.³ It may be thus described. Supposing the fissure to be on the left side, a flap is made by carrying the knife through the right side of the fissure commencing from below upwards, and is left

¹ 'Costello's Surgery,' vol. ii, p. 815.

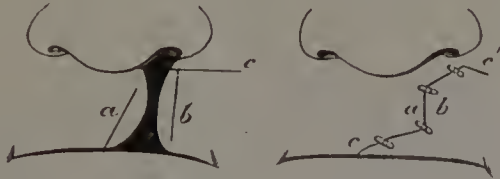
² 'Med. Times and Gaz.,' July 2, 1859, p. 10.

³ 'Dictionnaire de Médecine,' p. 703. See also M. Coste, of Marseilles. 'Lancet,' vol. ii, 1851, p. 203.

adherent above (fig. 26 *a*). On the opposite side an incision is made in the reverse direction, that is, from above downwards, and left attached by a pedicle at the prolabium (*b*). In some cases

FIG. 26.

FIGS. 27.

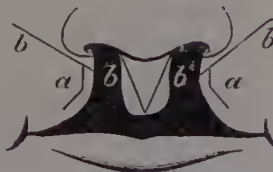


Giraldés' operation.

the flap may be increased by making a transverse incision (*c*), as recommended by Paré, Guillemeau, and Van Horne. The flap *a* is now brought up horizontally, and the flap *b* is brought down, and when united the parts have the appearance represented in fig. 27.

Sédillot suggested a cheilo-plastic operation. The sides of the central tubercles being pared, a flap of soft tissue is taken from each side, as shown in the engraving (fig. 28). The flaps *a a* are brought down to form the red margin of the lip, and the raw surfaces *b b* come in contact with the raw surfaces on the sides of the central tubercle *b' b'*.

FIG. 28.



Sédillot's operation.

Friedberg performed a somewhat similar operation in cases of single harelip.

Dr. Allen Duke proposed an operation by which the skin was not involved. It is thus described by him :¹—"The edges are pared, not in the usual way, but by an oblique incision from before backwards, slightly concave, and are to be brought together neatly by two or more sutures, each armed by two curved needles, which

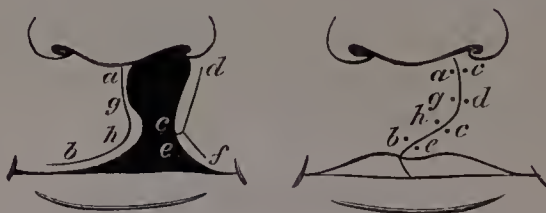
¹ 'Lancet,' March 20, 1858, p. 287 ; and Prof. Soupart's observations thereon, 'Lancet,' July 17, 1858, p. 64.

are to be introduced immediately under the skin, carried through the remaining thickness of the lip, and firmly tied *internally*. To facilitate the removal of the two upper ones, the ends of the suture should be brought out at the angle of the mouth, and secured externally by adhesive plaster, strips of which are to be applied the more firmly to bring and retain in contact the skin."

Dr. M. H. Collis, of Dublin, speaks thus of an operation,¹ which he calls "the æsthetic treatment:"—"I never throw away a particle of the parings. My incisions are made so as to make every fragment of them useful. On one side they are preserved to make the thick lip, and on the other to increase its depth. The method is somewhat complex, but a reference to the accompanying figures will make it intelligible (figs. 29, 30). When dealing with single harelip, I take the larger portion, that which includes the middle bit, and pare it freely from the nostril round the margin from *a* to *b*, until the point of the knife comes opposite

FIG. 29.

FIG. 30.



Collis's operation.

the frænum. This incision goes through all the tissues of the lip *except* the mucous membrane. It follows the curved line of the margin of the fissure, and leaves a long wound, which is curved towards the fissure. The flap is left loose and attached only by mucous membrane. On the other or smaller side of the lip, where we generally find the tissues thin, especially as we approach the nostril, the treatment is quite different. I transfix the lip at *d* close to the nostril; and carrying the knife along parallel to the margin, as far as *f*, I detach a moderately broad flap, which I leave adherent above to the ala nasi, and below to the free margin of the lip well beyond or external to the rounded angle at the fissure. 'This flap, which (unlike the

¹ 'Dublin Quarterly Journal,' vol. xlv, 1868, p. 296.

one at the opposite side) comprises *all* the tissues of the lip, is now divided into two at its centre (*c e*). I thus get two loose flaps, a superior (*c d*), attached to the ala nasi, and an inferior (*e f*) hanging on to the free margin of the lip. The loose end of the upper flap is turned up so that its raw surface faces the wound in the opposite side of the fissure, and the lower end of the lower flap is similarly turned down. The point *c* is brought up to *a* and fastened there. The point *e* is brought down to *b* and fastened there. I have thus got on the small side of the lip a wound as extensive as that on the larger side. The upper flap completes the outline of the nostril. The lower one supplements the outline of the free margin of the lip. I thus get a lip nearly double in depth which I could possibly have got by the ordinary incisions."

Dr. Stokes's operation (fig. 31) is a modification of that just described. He says:¹ "I seize the edge of the cleft at its lower extremity with a double hook, draw the parts forward and make an incision through the entire thickness of the lip, taking care however to stop about two or three lines above the red border of the lip. I then make a similar incision on the

FIG. 31.

Stokes's operation.²

opposite side. The two points *a'* and *a* can thus be brought down below the red border of the lip, thus forming a projection. The next step consists in making a vertical incision (*K B*) through the entire thickness of the lip with scissors at the upper angle of the cleft; but this is only necessary in cases where the labial cleft does not extend into the nose. The making of the

¹ 'Dub. Quart. Journal,' vol. 1, 1870, p. 4.

² In referring to this woodcut it should be remembered that the incisions which go through the *entire* thickness of the lip are indicated by *black* lines, and those which do *not* go through the entire lip are indicated by dotted lines.

partial incisions at the edge of the cleft on either side constitutes the third stage of the operation. These incisions are made going through fully two thirds or three fourths of the thickness of the lip from the upper point of the vertical incision κ down to b on one side, and from κ to b' on the other, and taking care not to injure the mucous membrane. The two quadrilateral flaps $\kappa \text{ B } a b$ and $\kappa \text{ B } a' b'$ can then be turned back, and the broad raw surfaces of each brought into apposition."

Lastly, I may refer to an operation recommended by Mr. Thomas Smith.¹ It is useful, he says, in suitable cases of double harelip. The lateral sides are pared in the manner shown in the fig. 32 $a' a$, and two flaps are taken from the central tubercle, but are not to be detached at their lower margins. "The wound is closed by drawing down the flaps from the side of the central

FIG. 32.



T. Smith's operation.

tubercle and attaching them to the raw surface on the lower margin of the lip."

Various instruments have been devised to restrain the hæmorrhage during the operation, and others to keep the parts in apposition in the after treatment. In most of the operations just described the proceedings are somewhat tedious, and in these cases the sides of the lips may be compressed with some

FIG. 33.

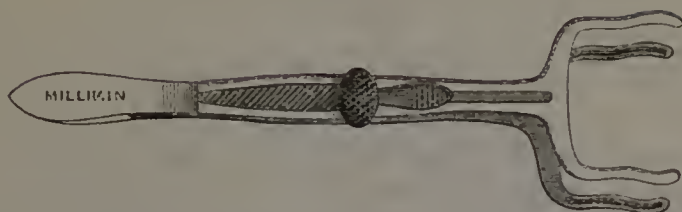


convenient instrument made in the form of forceps, such as this (fig. 33)—

¹ 'Lancet,' Dec. 28, 1867, p. 799.

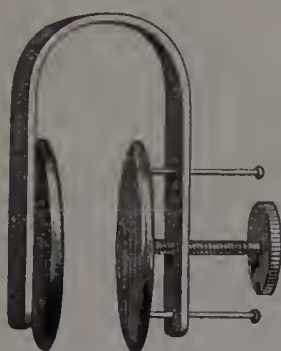
Or this, suggested by Mr. T. Smith (fig. 34)—

FIG. 34.



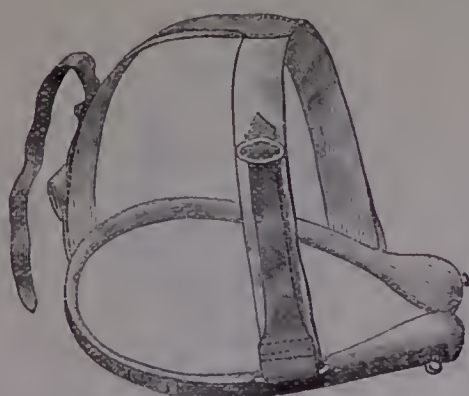
Or by using the lip tourniquet of Mr. Augustin Prichard, of Bristol (fig. 35).

FIG. 35.



Such instruments are, however, scarcely required, provided the surgeon has trustworthy assistants about him. Liston was alive to this point when, in referring to operations on the lips,

FIG. 36.



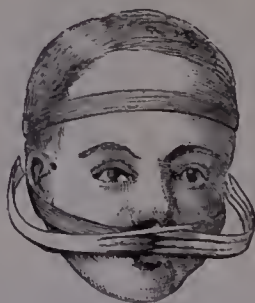
Hainsby's compressor.

he remarked that "there were many kinds of forceps for holding the lip whilst cutting it, but he advised his pupils always to

use their fingers. Instruments, many of them, were invented for those whose fingers were useless.”¹

The instrument known as Hainsby’s compressor (fig. 36) is in some cases invaluable, but in most instances it may be dispensed with. It is, I think, found to be most useful if worn *before* the operation, so as to bring the sides of the fissure nearer the one to the other and also to approximate the superior maxillæ. The chief drawback of the instrument is that it does not always fit accurately, and in many cases I have observed that as the spring encircles the back of the head it is subject to pressure during the nursing of the child, and hence the cheek pads are apt to get displaced. In Mr. Dewar’s paper on harelip, already referred to, he describes an instrument that is somewhat similar in construction, but it is not quite clear from the description (for there is no woodcut) that the spring came from behind forwards, as in Hainsby’s instrument. Mr. Dewar speaks thus of the apparatus: “It occurred to me that as a very slight degree of pressure on the cheek on each side near to the corner of the mouth relaxes the upper lip, a narrow piece of steel having a spring, might be so adapted as effectually to answer the purpose. I had a spring made, nearly resembling a pair of sugar-tongs, and so padded as to press upon the cheek near the mouth. It was kept in its place by a narrow tape tied *over the chin*, and by three tapes, which were fastened, one *behind* and one on each *side*, to a piece of leather placed on the crown of the head.”²

FIG. 37.



Louis's bandage.

Other and more complicated instruments have been devised to support the lip, but, as a rule, a well-applied strip of plaster

¹ ‘Lancet,’ 1835, vol. i, p. 598.

² ‘Ed. Med. and Surg. Journal,’ 1830, p. 89.

answers the purpose most efficiently. It should have four ends, and the centre should be narrowed so as not to compress the nose. It is also useful to make small holes in the situation of the points of the needle, so as to avoid pressure on them (see fig. 17), and a pad of lint may be placed on each cheek, so as to give the lip additional support.

I have occasionally used Louis's bandage with advantage (fig. 37). It consists of a double-headed roller about an inch wide, and two yards in length. The centre of the bandage is placed on the middle of the forehead, the two ends are then carried behind the head over the ears to the occiput, where they are made to cross and are brought forward again. Two slits are now made in one end, and the other end split into two. The two ends are then passed through the two slits, and thus by making traction on the ends the edges of the lip are brought together. The bandage is completed by carrying the ends back again to the nape of the neck, and there fastening them. This bandage may be modified to suit particular cases.

I take the opportunity of expressing my acknowledgments to Mr. T. P. Collings for the care and artistic skill which he has exercised in producing the illustrations accompanying this paper.

